Statistics 518/418 PROBABILITY
Fall 2020

Special provisions related to on-line teaching

On-line instruction is a challenge for the instructors and students. The principles that I will try to use is the informal style, as much contact with students as desired (skype, zoom, or email), and extended office hours. The slides with material will be available on Canvas in advance (1-2 days), and the actual class presentations will be cloud recorded.

The course will be taught by Zoom, using introductions and discussion in video-conference format, but the material will be explained using pdf slides, which will be annotated "live" by the instructor following questions from the audience, or simply to fill in details of derivations and so forth.

At the beginning of each class, there will be a short 3-5 minutes quiz, with answers submitted either by chat or by Canvas quiz facility (which one is used will depend on circumstances, but will be clearly indicated). Quizzes are designed as a "warm-up" and previous class material refresher before new material is taught. They will be kept very simple.

Homeworks will be posted on Canvas and solutions submitted electronically to the TA. Solutions can be either printed or scanned or photographed from handwritten pages. Team work is encouraged for homeworks. Final redaction has to be done personally. Verbatim copying of homework assignments is a violation.

From the Course Announcement:
Topics include random variables, distributions, transformations, moment generating functions, common families of distributions, independence, sampling distributions, and basic stochastic processes. Stat 518 will have more advanced assignments and examinations focusing on theoretical methods.

Instructor: Marek Kimmel, Professor, DCH 2102, x 5255, kimmel@rice.edu.
TAs: TBA

Evaluation
Two tests ***(different for Stat 481 and Stat 518)***, midterm (20%) and cumulative final (35%)
Friendly short quizzes (15%) at the beginning of each class
Homeworks (***different for Stat 481 and Stat 518***, 30%)

Honor Code
Homeworks can be discussed in groups. Final redaction has to be done personally. Verbatim copying of homework assignments is a violation.
Tests and quizzes are under Honor Code rules and have to be completed without collaboration or help from others.

Attendance: Recommended. Quizzes missed can be retaken if a justifiable cause for absence at the quiz is presented.

Text:
Casella and Berger "Statistical Inference", 2nd Ed., Brooks/Cole 2002

Course material Chapters 1 – 5, except for specific sections (different for Stat 418 and 518) as indicated by the Instructor.

Lecture Notes and Study Guides: The class will be taught by performing mathematical derivations on the whiteboard with a sporadic use of projected slides. Study guides will be issued ahead of each test.

Problem solving sessions:
TA will run non-obligatory problem solving sessions (frequency and place TBA) at which any problems, questions, derivations and so-forth, can be addressed.

Office hours:
Dr. Kimmel will set up 2hr office time twice a week, during which anybody can connect by Skype (at marek_kimmel), by zoom (the exact method to be developed), or email. Dr. Kimmel will be also available for short contacts outside these hours, with a 1-day advance notice.
TA will set up his office hours too.

Contents and style of the course

Casella and Berger's book is an established academic manual and reference, covering mathematical foundations of statistics, including relevant aspects of probability theory. Presentation is kept at the elementary differential and integral calculus level and is mostly self-contained. The book includes a large number of instructive examples that illustrate the theory and help develop it in many directions.

The course is aimed at covering the material in Chapters 1-5. ***Sections and proofs that will not be required, will be explicitly listed by the instructor (different lists for Stat 418 and Stat 518)***. It is difficult to cover all details in class; therefore, self-study from the book is essential. To facilitate this and provide interaction, the TA will run non-obligatory problem solving and Q/A sessions (time and location TBD). Problems to discuss should be submitted in the morning the day before the session by email.

Chapters from Casella and Berger

1. Probability
2. Transformations and Expectations
3. Common Families of Distributions
4. Multiple Random Variables
5. Properties of Random Sample

Course objectives and outcomes:

1. Develop understanding of the mathematical structures underlying probability and statistics.
2. Develop skills and appreciation for mathematically rigorous statements and proofs.
3. Practice the transition from heuristic understanding of the problems to placing them in the frame of the theory and developing solutions.

Outcome: A toolbox of techniques to understand further advanced and specialized methods in statistics.

Students with disabilities are encouraged to attend: Regarding accomodations, please contact both the instructor and Disability Support Services at: http://dss.rice.edu/
In particular: A student with a disability has a responsibility to contact DSS if any accommodations are required. If accommodations are needed, the student with a documented disability will receive an

accommodation letter from DSS to take to each instructor. It is the student's responsibility to deliver these letters as soon as possible. Instructors expect to receive notification early in each semester; students who deliver their letters later may encounter difficulties. Good, early communication is vital to the accommodation process.

Changes: The syllabus is subject to change with reasonable advance notice by the instructor.